

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 April 2004 (29.04.2004)

PCT

(10) International Publication Number
WO 2004/035994 A1

(51) International Patent Classification⁷: **F01D 17/16**,
17/14

(21) International Application Number:
PCT/IB2002/003834

(22) International Filing Date:
18 September 2002 (18.09.2002)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **HONEYWELL INTERNATIONAL INC.** [US/US]; 101, Columbia Road, Morristown, NJ 07962 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LOMBARD, Alain** [FR/FR]; c/o HONEYWELL GARRETT, B.P. 19 - Z.I. Route d'Oncourt, F-88150 Thaon-les-Vosges (FR). **SEVERIN, Emmanuel** [FR/FR]; c/o HONEYWELL GARRETT, B.P. 19 - Z.I. Route d'Oncourt,

F-88150 Thaon-les-Vosges (FR). **HETTINGER, Raphael** [FR/FR]; c/o HONEYWELL GARRETT, B.P. 19 - Z.I. Route d'Oncourt, F-88150 Thaon-les-Vosges (FR). **LAVEZ, Alexis** [FR/FR]; c/o HONEYWELL GARRETT, B.P. 19 - Z.I. Route d'Oncourt, F-88150 Thaon-les-Vosges (FR).

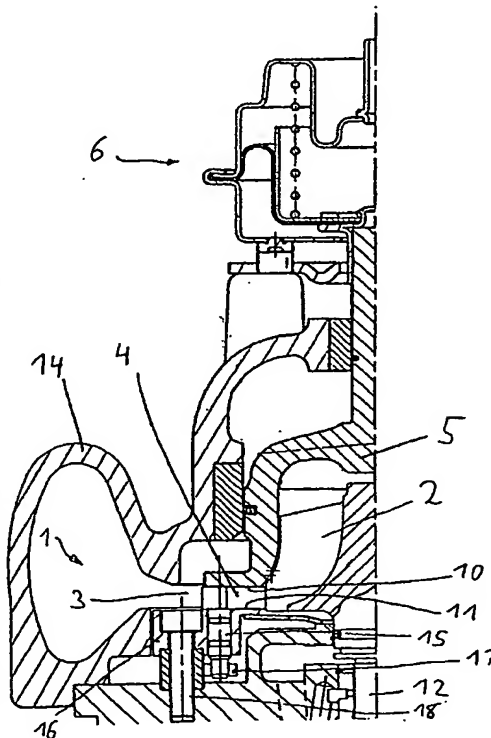
(74) Agents: **CHIVAROV, Georgi et al.**; TBK-Patent, Bavaring 4-6, 80336 München (DE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: **VARIABLE NOZZLE DEVICE FOR A TURBOCHARGER AND METHOD FOR OPERATING THE SAME**



(57) Abstract: A variable nozzle device (1) for a turbocharger comprises an annular nozzle (3) formed between an inner wall (11) and an outer wall (10), and an annular arrangement of adjustable vanes (4) interposed in the nozzle (3) for defining a plurality of nozzle passages, wherein the nozzle (3) is adjustable by controllably adjusting the vanes (4) and by controllably varying an axial clearance between the outer wall (10) and the vanes (4).

WO 2004/035994 A1

BEST AVAILABLE COPY

WO 2004/035994 A1



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— with international search report

BEST AVAILABLE COPY